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Future Technologies

> *In the family planning training course, nearly every student said, "There should be more alternatives that are more effective for a longer period of time and with fewer side effects. When can we offer new contraceptives to our clients?"*

Researchers are investigating new contraceptive methods that may appear in the next decade. This chapter briefly presents some of the methods currently under development.

Hormonal methods, such as pills, implants, and injections, are popular among African women. Researchers are working to develop improved versions of these methods. Mothers need hormonal methods they can take safely while breastfeeding. The prime candidates are the natural hormone progesterone and a synthetic with the code name ST-1435.[6] It is too early to say whether any of these methods will be available by the next decade.

The widespread threat of acquired immunodeficiency syndrome (AIDS) and other sexually transmitted infections (STIs) created a need to find contraceptive methods that women could use on their own to protect themselves. Barrier methods have long been used by women to avoid both pregnancy and disease. Researchers are working to improve the contraceptive effectiveness of these barriers and reduce their annoying side effects. Chemical barriers are also under study as another method to reduce the risk of STIs.

The last two to three decades of research notwithstanding, a vaccine to prevent pregnancy is not likely to be available for some time. The most advanced testing has been conducted with vaccines acting on human chorionic gonadotropin (hCG).[1] Because these vaccines are abortifacients, it is unlikely that any company will pursue their development vigorously. Other antigens that prevent fertilization, including a variety of sperm and zona pellucida antigens, are more promising politically but are so early in development that none will be available in the next decade.

HORMONAL METHODS

IMPLANTS

Implanon	Implanon is a single implant effective for 2 to 3 years. The implant is currently undergoing large-scale clinical trials worldwide and should appear on the market in a few years.[2]
Norplant II	Norplant II is an improved version of Norplant that contains two rods instead of six. It may be on the market soon.[5]
Biodegradable implants	Biodegradable implants dissolve in the body and do not need to be removed. Pellets the size of grains of rice would be effective for 2 years.[9] Another new implant is made from tubes, as is Norplant; these tubes degrade after 2 years.[4]

INJECTABLES

Levonorgestrel butanoate	An alternative to depot medroxyprogesterone acetate (Depo-Provera), it could be available in the late 1990s.
Estrogen-containing injectables	The World Health Organization has tested a number of monthly injectables that contain an estrogen as well as a progestin to minimize bleeding disruptions caused by progestin-only methods.

Vaginal rings	Vaginal rings, when placed deep in the vagina, provide another method of continuously delivered progestins. Researchers are developing devices that are less irritating to the vagina and that have both estrogen and progestin.
Natural progesterone	Natural progesterone is being tested in vaginal rings, suppositories, and injectable polymeric microspheres. The rings stand the best chance of being approved for routine clinical use.
ST-1435	ST-1435 is being tested in skin creams, transdermal devices, vaginal rings, and subdermal implants.

MECHANICAL BARRIER METHODS

Female condom	Available in Europe and the United States. Because of its design, the female condom protects all of the vaginal lining, thus providing good protection against pathogens.
Lea's shield	A one-size-fits-all diaphragm-like device. A one-way valve allows uterine and cervical fluids to escape yet prevents sperm from getting into the cervix. This device should be approved by 2000.
Femcap	This cervical cap comes in three sizes; the size selection is made based on the user's parity.[8] Femcap should be approved by the end of the decade.
Silicone diaphragm	An easy-to-fit silicone diaphragm might well be more comfortable and easier for women to use than conventional diaphragms.

Intrauterine Devices

Frameless IUD	The frameless copper IUD does not press against the uterus and thus reduces cramping.[10] A thread secures the sleeves at the fundus.
Levonorgestrel IUD	This IUD provides 7 years of protection.[7] It reduces excessive bleeding and may protect against pelvic inflammatory disease by thickening the cervical mucus. This IUD is available in some countries but not in others.

METHODS FOR MEN

Vaccines	A vaccine using luteinizing hormone-releasing factor (LHRF) linked to tetanus toxoid shuts down the testes; the user would need to take testosterone. A vaccine based on follicle stimulating hormone (FSH) tested in monkeys eliminates sperm while maintaining normal testosterone levels.
Hormones	Testosterone enanthate (TE) reduces sperm production to levels that may be low enough to prevent pregnancy.[11] However, the current weekly injection schedule is impractical. Implants that can deliver testosterone for 2 to 3 months to a year are under study.[2]
Plastic male condom	A search has long been under way to develop condoms with improved feel and durability. A new polyurethane condom with a traditional design may allow the user more sensitivity, perhaps making the device more acceptable to many men who dislike the currently available condoms.

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